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AGROECOLOGICAL SUSTAINABILITY, GREEN ECONOMY AND BUSINESS MODEL OF FINANCIAL INTEGRATION

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ABSTRACT

Ecosystem management is the process of maintaining basic agro-ecological services and restoring natural resources, it meets the modern challenges of the younger generation – their socio-economic, political and cultural needs.

The main condition for sustainability in ecosystem management is the effective maintenance and social use of natural resources. This is a multilateral approach that requires significant changes in terms of natural processes and the human impact on the environment.

Nowadays, when global problems are getting worse, it becomes more and more necessary to study the fundamental processes of the production of material and energy in nature. Attention should be paid to the growing influence of proper human activity on the planet's biochemical cycle, the inappropriate impact of human activity can lead to a global ecological crisis. Sustainability of agroecosystems, optimal use of natural resources, protection from environmental pollution, stimulation of reproduction, etc.

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Introduction. Georgia is located in the southeastern part of the European continent, on the border of the temperate and subtropical climate and covers the central and western parts of the Transcaucasia.

The total land area is 69.7 sq.m.

Georgia is a very interesting country due to the variety of natural complexes and with the peculiarities of the planning of the household-population. There are almost all types of natural landscapes (except tropical). The relief is represented by deep valleys with mountains and plateaus, with flat plains and hollows stretching along the foothills, which have a hypsometric development and shape. Climatic conditions are characterized by a variety of species: from subtropics to eternal glaciers.

Ecosystem management, conditions and approaches to agro-ecological sustainability

There are several different approaches to ecosystem management that involve conservation efforts at both local and landscape levels. Some researchers explain the sustainability of ecosystems in different ways. In general, the explanation of ecosystem management processes typically is general in nature and depends on several principles and is determined by several basic principles, which limits the overall concept and gives it a general meaning:

1. Ecosystem management reflects the current evolution of social values and priorities; This is not a beginning or an end;

2. The ecosystem is managed locally and local boundaries must be formally defined;

3. Ecosystem management needs to maintain ecosystems in good condition, to achieve the desired social benefits;

4. Ecosystem management should use the ability of ecosystems to respond to various natural and anthropogenic processes; However, all ecosystems have a limited ability to manage and maintain processes;

5. Ecosystem management may or may not lead to biodiversity;

6. The term “sustainability” should be clearly defined, if used at all in ecosystem management, in particular, issues of concern, benefits and costs, and the relative priority of benefits and costs;

7. Scientific information is important for the effective management of ecosystems, but this is only one task in the decision-making process, which, in fact, depends on public and private choices.

To ensure the long-term sustainability of the production of ecosystem services, goals should be clear, well defined. Important requirements include a obvious environmental understanding of the system; Including communication, ecological dynamics and context. The role of humans as a component of the ecosystem and the use of adaptive management are also important. As a concept of natural resource management, ecosystem management remains vague and controversial; partly, because some of its formulations are based on conflicting political and scientific evidence, the provisions are important for understanding most of the ecosystem management conflicts. Human created production as an open system and engage in it - the natural resources and got an economic benefit; and at the end of the cycle - a human throws garbage in a landfill. Such production is contrary to the general principle of life - the principle of a closed cycle. To prevent an ecological crisis, it is necessary to create agroecosystems according to the natural type, which is characterized by a closed cycle of substances. Examples of this are traditional agriculture in China and Japan. All organic waste was used here, and the soil remained fertile for thousands of years. The basic principles of organizing waste-free agricultural production have been determined. The main condition for the functioning of the economy is the obligatory combination of agricultural and livestock production. Depending on the specific conditions, the proportions of these industries may differ; But in all cases, livestock, using crop residues, organic fertilizers, provides a closed cycle of use of mineral nutrients.

The second important element is a crop rotation system that coincides with successive changes in natural processes. Consecutively planted crops on the same plot must largely meet the needs for mineral nutrients, to help maintain and improve the physical properties of soil water, nitrogen nutrition levels. We maintain resistance to evolutionary traditions of the wild nature. The transition to polyculture, the use of all organic waste in this field, corresponds to the development trend of natural biospheric processes and, in addition to high productivity, ensures the maximum density of the earth's surface

Solving the problems of planting the agro-industrial complex, we need to learn how to create an agricultural landscape with an optimal combination of artificial and natural ecosystems; that will drastically reduce the impact of the agro-industrial complex on the environment. It is necessary to adapt agricultural production to the existing natural conditions as much as possible with minimal changes. The ratio of intensively (urbanization, arable land) and widely used lands (forest plantations, meadows, reserves) in each landscape should not exceed the established limits. Terrestrial ecosystems are most resilient in forests, swamps, natural grasslands and pastures. In this rating, agroecosystems (field, garden) is one of the last places. Thus, in order to increase the biological productivity of agro-ecosystems and their ecological sustainability, the optimal (percentage) content of forest vegetation, natural meadows, pastures, rivers, lakes, swamps, "deserts" and etc., i.e. a mixture of different ecological systems is appropriate. At the same time, arable land, meadows, forests and livestock play an important role in the ecological optimization of the structure of agricultural landscapes. The sustainability of agroecosystems is also determined by the cultivation of protective forests. They have a great influence on the regulation of runoff, the hydrological regime of the area, the improvement of the microclimate and the increase in the yield of agricultural crops. Using only 14% of arable land along the border of the fields, forest belts can increase yields by 15-20%. Sowing of perennial grasses also indicates to the sustainability of agroecosystems. The presence of meadows and forests determines the cycle of nutrients (N, P, K) required for the ecological balance in the soil, Prevents the development of soil erosion, absorbs and neutralizes fertilizers and pesticides away from fields, prevents areas from being flooded with water.

Waste recycling is also important, this allows us to solve not only agro-ecological problems, but also the tasks of reducing significant losses of useful components of raw materials contained in waste. For example, any plant biomass can be fully utilized in a biotechnological process.

In many countries there are means for the processing and disposal of liquid waste from livestock complexes. During their processing, a solid fraction is released - sludge (used as an organic

fertilizer), liquid - disinfected wastewater (fertilizers, industrial water), gas - biogas (contains 60-70% methane), used as fuel. The fertilization process is complex, so fundamental research is underway and looking for new ways to use it. Intensive work is underway to create services that will work as natural ecosystems, waste-free agricultural production will be promoted. Unlike agricultural land, a livestock complex is an artificial ecosystem, with an almost closed-loop material cycle. Autotrophs are represented by algae and hydroponic green heterotrophs - cattle, sheep (or pigs), birds, and fish.

One part of the fertilizer is used as plant fertilizer, the other is used for animal feed, and the third is abiotic decomposed into oxygen and hydrogen. The animal house is enriched with oxygen and hydrogen is used for converter generators, as an energetic material. Converter products are only pure water and high quality meat.

According to the United Nations Environment Program, due to Green economic initiative: “The goal of a green economy is to improve human well-being and social equity, this also significantly reduces environmental risks and environmental deficits. "

The green economy is considered a component of economic theory, where it is considered a part of the ecosystem. According to classical economics, it is not considered independent because it is considered an integral part of science. In particular, it is traditionally considered that land, as one of the main factors of agricultural activity, is real estate and includes natural capital associated with the second factor of production - labor. At the same time, it should be noted that the green economy does not separate the state and the private sector. It is considered to be a positive alternative to economic decision making. The main regulator of the green economy is not the state or private business, but the society that controls it themselves.

The concept of "green economy" – is a rather widespread concept. Its explanation implies that it is possible to ensure sustainable development and eradicate poverty by introducing green philosophy and principles into the economy.

There are at least two types of terms and definitions related to the green economy: terms that define the current process (“green economy”, “green growth”) and established terms related to the result (“green economy”). At the same time, attention should be paid to the fact that a green economy, as a rule, does not involve excessive government intervention and does not contradict the principles of a market economy.

A green economy is an economic development model that reduces environmental risks and ecological problems, aims to achieve sustainable development and reduce the negative impact on the environment. It is closely related to the environmental economy, contributes to the achievement of sustainable development through the development of appropriate policies, integrates social and economic issues arising from environmental protection, agricultural activities. The green economy consists of six main sectors: environmentally friendly agriculture; renewable energy sources; environmentally sustainable infrastructure; water resources management; waste and land management, one of the components of which is agriculture.

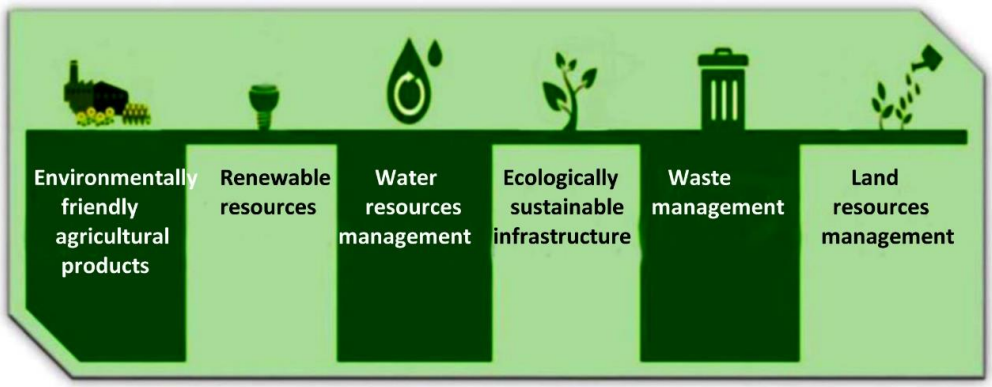

Fig.1. Determinants of the green agroecological cycle

The development of Georgia's economy, especially its agricultural sector, is highly dependent on the use of the country's natural resources and its ecosystems. Air emissions, surface and groundwater and soil pollution are serious problems, especially in regions where industry is developed. The Georgian economy is distinguished by a very high consumption of energy and

resources. These indicators of Georgia are 2-2.5 times higher than those of Western countries. It is also important to protect the socio-economic and cultural resources of the mountainous regions of Georgia, sustainable use and, if necessary, renewal.

In fact, the green economy is more "market oriented" than existing models. In fact, ignoring agroecological, environmental and social issues leads to wrong decisions, to an unfair redistribution of resources by market participants and to the global financial and economic crisis. The long-term prospects for a green economy differ from traditional economies in terms of the long-term effects of the latter and, as a consequence, increased stability.

New business model. A service-based **circular economy** business model better adjusts resource efficiency incentive factors:

- Long-term contracts for private financial enterprises;

New design and specifications:

- Creation of long-term products;
- Long-term infrastructure reduces costs and consumption of resources
- Reuse calculation flexible, easily customizable and reusable products / infrastructure;
- The calculation of product recovery is based on its optimal processing after consumption.
- Agricultural production operating under a profitable, efficient management system;
- Resource efficiency, a critical assessment of the current situation in order to reduce costs and consumption of resources / energy / water.

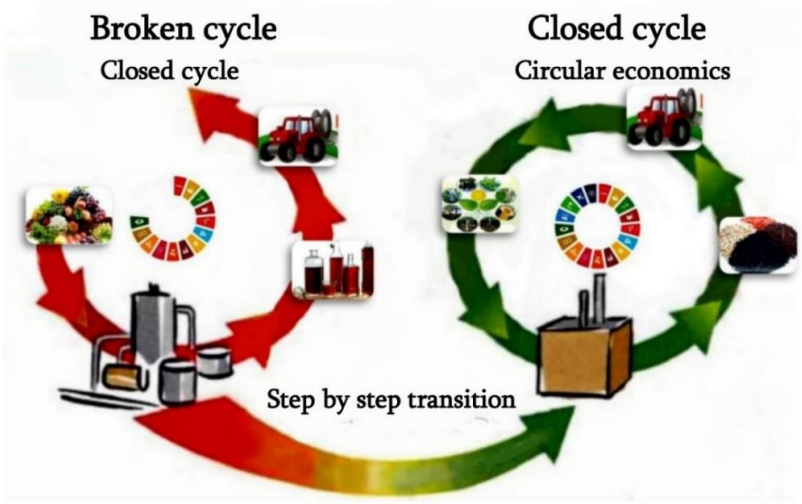

Fig.2. Moving from a linear economy to a circular economy

Measures to be taken for the implementation of the green economy:

- It is necessary to change the model of agricultural production, efficient use of energy and resources (Agro-innovation, agro-design, cleaner agro-production, integrated approach, etc.)
- Changing consumption models by increasing the volume of transportation, production and service of organic agricultural products.

One of the most important factors in achieving a green economy is green business, the definition of which depends on the various measures that need to be taken. Initially, the business providing agri-environmental services for the environment was called a green business. Nowadays, "green" is comparative rather than absolute, and depends on the ratio of "green" activities, this contrasts with the usual agribusiness activities in the agricultural sector.

Green business, like normal business, tries to maximize profits. However, since it is focused on long-term profit, it has advantages, among them - the consistent and sustainable implementation of modern methods, more knowledge, information and planning means.

From today's perspective, with a growing global population and scarcity of resources, countries that are more rapidly adopting a green economy in their daily lives and in agriculture will become more competitive and socially equal.

Therefore, it is necessary to launch a financial business model and take urgent priority measures, namely:

Technical assistance - Target areas of business activity:

- Energy and resource audits to identify green investments;
- An integrated technical, financial and marketing team to support the bank's clients in obtaining targeted concessional loans aimed at the farmer (peasant) to ensure sustainable economic activity;
- Assessment of risks associated with vulnerability to climate change and agricultural activities;
- Transient deficiencies and scoping studies

Projects and investments - activity tailored to financial instruments:

• Direct financing;

• Indirect financing with the participation of banks;

Investment support grant for the transfer of green technologies;

• Mixed low-interested agricultural loans to overcome access and risk perception;

• Agricultural insurance.

Governmental support-Government involvement and ongoing collaboration;

- Solving problems in sustainability, environmental and agricultural issues;
- Strengthening the institutional and regulatory framework and production of environmentally friendly agricultural products, creating optimal conditions for green investment.

Results. Thus, we can say that the essence of agricultural crops is the maximum separation of mineral nutrients and moisture circulation elements, self-improvement of soil properties, minimal loss of agricultural products, i.e. uselessness. In order to make an agroecosystem sustainable, it is necessary to minimize anthropogenic impact on it, so that the natural ecosystem can "work". Such a green economy will maintain the natural balance of the entire agricultural landscape and provide the population with the products they need. In the context of sustainable economic development, we are dealing with the prospect of long-term economically efficient management, with maximum consideration of environmental issues in a circular economy, which implies the use of biological resources in a way that does not endanger the biological diversity of the environment and the next-generation environmental requirements must also be taken into account.

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